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ABSTRACT

A two-phase project was designed to (1) provide curriculum guidelines in agribusiness, natural resources, and environmental protection for classroom teachers and others in education to facilitate the process of career education at K-12 levels (Phase 1) and (2) provide evaluative information concerning the curriculum guides by nationwide field testing (Phase 2). The procedures in Phase 1 involved four major task areas: (1) The identification of 400 specific occupations considered relevant for providing a basis for curriculum development, (2) a review of the state-of-the-art of curriculum development in these occupational areas, (3) the development and formative evaluation of 10 curriculum guides, and (4) the initial dissemination of the guides to the 50 states. Field testing of the guides (Phase 2) included three components: (1) Monitoring of teacher reactions to the guides' usefulness (2) monitoring dissemination policies and procedures for curriculum guides, and (3) assessing student achievement as a result of using the guides. Dissemination activities varied widely among the states, with greater effort made to disseminate the eight high school level career preparation guides. Responses from the 35 K-9 teachers were generally favorable, and reactions of the 137 vocational education teachers towards the career preparation guides was very positive. Specific conclusions and recommendations, along with a bibliography, are included in the report. (RG)

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Final Report

Project No. V257018
Contract No. OEG-0-72-4677

CURRICULUM DEVELOPMENT BASIC TO THE TRAINING OF INDIVIDUALS FOR EMPLOYMENT IN AGRIBUSINESS, NATURAL RESOURCES, AND ENVIRONMENTAL PROTECTION

Volume One of Five Volumes

Curriculum Development Project
in Vocational Education
Conducted Under
Part I of Public Law 90-576

The project reported herein was performed pursuant to a contract with the Office of Education, U. S. Department of Health Education, and Welfare. Contractors or grantees undertaking such projects under Government sponsorship are encouraged to express freely their professional judgement in the conduct of the project. Points of view or opinions do not, therefore, necessarily represent official Office of Education position or policy.

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SUMMARY

The curriculum project entitled "Curriculum Development Basic to the Training of Individuals for Employment in Agribusiness, Natural Resources, and Environmental Protection (OEG-0-72-4677)" was initiated on June 15, 1972. The curriculum guide development phase of the project was completed on June 15, 1974. However, upon completion of the curriculum guide development phase, which resulted in ten national career education curriculum guides in the areas of agribusiness, natural resources, and environmental protection, an extension of the curriculum project was granted to field test the curriculum guides in schools. The duration of the extension of the project was from June 15, 1974 to June 14, 1976.

Goals

The major goal of the curriculum guide development phase of the project was to provide curriculum guidelines in agribusiness, natural resources and environmental protection for teacher educators, administrators, guidance counselors, classroom teachers and others in education to facilitate the processes of career education at the various stages of career awareness, orientation, exploration and preparation.

The major goal of the field test phase of the project was to provide in-depth evaluative information concerning the ten curriculum guides.

PROCEDURES

The curriculum guide development phase of the project had four major task areas. In completing Task I of this phase of the project, the major occupational categories within the agribusiness, natural resources, and environmental protection areas were identified and specific occupations within each area were compiled. From the listing and classification of the specific occupations, 400 were identified as being current and relevant to the project. The lists of occupations were reviewed by an industry advisory committee for completeness and representativeness of current or emerging occupations and to indicate the level of education which would be appropriate for each occupation. The lists of occupations then served as a basis for providing content and learning activities in the various career education curriculum guides.

The activities in Task II of the curriculum guide development phase of the project involved a determination of the state of the art in curriculum development in the agribusiness, natural resources and environmental protection areas. Identification of extant curriculum guides was accomplished utilizing various sources of such documents. The identified curriculum documents were classified into five categories to better define their nature. In addition, a review instrument was developed for use by the project staff in further classifying each document. The information obtained through collecting and reviewing the curriculum documents was utilized in identifying the elements which should be included in the format of the curriculum guides being developed.

Task III of the curriculum guide development phase of the project included the development and formative evaluation of the ten curriculum guides. The eight career preparation guides were developed by the project staff at The Ohio State University while the career awareness and career exploration guides were developed through a sub-contract with Eastern Illinois University. The major tasks included in the sub-contract were to develop two curriculum guides, evaluate and field test the guides, and to aid in dissemination. Occupations were selected for modular development based upon the following criteria:

1. The occupation selected should be related to subject matter being taught at the specific grade level.

2. The occupation selected would be of high interest for that particular grade level.

3. The occupation selected should be representative of the area to be introduced.

4. The occupation selected is one not usually presented in textbook materials as a career (providing more career awareness).

5. The occupation selected should help keep a balance between types of high school, technical school, and college training (employment requirements)

6. The occupation selected should be appropriate to the career development concept which was to be developed.

Each module developed had three basic parts: instructional information, instructional activities and culmination or evaluation activities. In development of the modules, the classroom teacher was considered to be best qualified to determine how a given knowledge or skill should be demonstrated and the quality and quantity of knowledge or skill required for a particular child or group of children. In addition to the modules, each career awareness and career exploration guide contains additional information for program planning.

Formative evaluation of the career awareness and career exploration curriculum guides was accomplished through use of the project staff developing the career preparation guides, numerous consultants, and the national advisory committee for the project. In addition, the modules were pilot tested by teachers and the resulting information was utilized in the revision process. A summative evaluation was also carried out upon completion of the in-school field testing. The focus of this summative evaluation was on describing the effects of the use of the materials by teachers, circumstances in which their use took place, and their effect on the student body.

The career preparation curriculum guides developed by the project staff at The Ohio State University included one each for the following instructional areas: agricultural production, agricultural supplies and services, agricultural equipment and mechanics, agricultural products (food processing), ornamental

horticulture, agricultural resources, forestry and environmental protection. Each guide contains two basic types of information: (1) information for administrative planning and development for specialized local programs and (2) instructional units for assisting teachers in planning teaching strategies.

Formative evaluation of the career preparation curriculum guides involved three primary groups of reviewers. These groups of reviewers included industry personnel, vocational teachers, and curriculum specialists. Industry personnel and teachers were selected to review those materials developed for the occupational areas in which they worked or taught. The group of thirteen curriculum specialists were selected to test the usefulness of the developed materials to state personnel responsible for curriculum development. Responses from the three groups of reviewers were used to determine the nature of changes necessary in preparing the final field test copy of the guides.

The final task of the curriculum guide development phase of the project was to provide for initial dissemination of the curriculum guides to the 50 states. This task was accomplished primarily through a national conference on dissemination of the guides. This conference was held May 12-17, 1974 at Columbus, Ohio, with 104 personnel representing 48 states present. At the conference, each participant was provided with two complementary copies of each of the 10 guides. The conference was utilized to help the change agent personnel present from the various states develop a dissemination strategy for their states. At the end of the conference each participant submitted a plan for dissemination and use of the guides.

The curriculum guide field test phase of the project had three basic components. The first component of the field test was a monitoring of the policies and procedures used by personnel in the various states in disseminating the curriculum guides. This component of the field test phase was initiated at the national conference on dissemination of the curriculum guides when the conference participants indicated their dissemination plans. This component was completed in the summer of 1975 with a follow-up questionnaire on which the participants reported their actual dissemination activities since the conference.

The second component of the field test included a monitoring of teachers reactions to the adequacy and usefulness of the curriculum guides. During this component of the field test, teachers were recruited to teach one of the instructional units from the ten national curriculum guides. Upon teaching a unit from one of the guides, each teacher was requested to complete an information form indicating his/her teaching activities as well as reactions to the adequacy and usefulness of the unit taught and the curriculum guide utilized.

The third component of the field test was implemented concurrently with the second. In this component of the field test an assessment of student achievement was made in classes whose teachers did or did not use the curriculum guides for instructional decision-making. In this component of the field test, criterion-referenced tests for each unit selected by the project staff for use in the field test were developed and pilot tested. Each teacher involved in the field test was asked to assume the following responsibilities.

1. Select one of the available units to incorporate into the curriculum
2. Administer pretests
3. Teach the selected unit
4. Administer posttests
5. Complete an information form describing planning and teaching activities

The career preparation teachers were divided into two groups with one group utilizing the national curriculum guides for planning their teaching strategy and the second group provided only the instructional objectives for their unit. All career awareness and career exploration teachers used the national curriculum guides in planning their teaching strategy.

RESULTS OF THE PROJECT

The curriculum guide development phase of the project resulted in development of ten national career education curriculum guides. These guides provided a coordinated educational program for grades K - 12 in the areas of agribusiness, natural resources, and environmental protection. The ten guides are as follows:

Career Awareness in Agribusiness, Renewable Natural Resources and Environmental Protection: A Curriculum Guide for Grade K-6
Career Exploration in Agribusiness, Renewable Natural Resources and Environmental Protection: A Curriculum Guide for Grades 7-9
Career Preparation in Agricultural Production
Career Preparation in Agricultural Supplies and Services
Career Preparation in Agricultural Equipment and Mechanics
Career Preparation in Agricultural Products (Food Processing)
Career Preparation in Ornamental Horticulture
Career Preparation in Agricultural Resources
Career Preparation in Forestry
Career Preparation in Environmental Protection

The results of the field test phase of the project can be divided into three components. The findings from the first component of the field test encompass two major areas: (1) the results of the survey concerning the dissemination plans of the participants at the National Conference on Dissemination of Career Education Curriculum Guides in Agribusiness, Natural Resources, and Environmental Protection (May, 1974) and (2) the results of the follow-up survey conducted in May, 1975. The conference participants planned a wide range of dissemination activities to be carried out in their states. However, the activity mentioned most often was to disseminate the guides in in-service workshops. The results of the follow-up survey indicated that the actual dissemination activities of the national conference participants varied widely among the states. It also seemed apparent that a greater effort was made in most states to disseminate the career preparation guides than to disseminate the career awareness and exploration guides. The overall reaction of the conference participants toward the guides was very favorable.

The findings of the second component of the field test included data from 35 K-9 teachers and 137 vocational agriculture teachers. As for their reactions to the adequacy and usefulness of the career awareness and career exploration curriculum guides, the K-9 teachers were generally favorable. The teachers indicated that the guides were used to the greatest extent and had the most value for determining the objectives or behavioral outcomes desired from instruction, selecting content or subject matter, and for selecting student activities. In reacting to specific statements concerning the guide and the unit taught, the K-9 teachers pointed out that they would prefer instructional materials to teach from rather than a curriculum guide for planning teaching strategies and that they believed the best use of the curriculum guides was for planning programs rather than developing teaching plans. The K-9 teachers also noted the dearth of adequate supportive materials for the units they taught.

Reactions of the vocational agriculture teachers toward the career preparation guides were very positive. An overwhelming majority of the teachers agreed that the units were technically correct as well as having a format which was desirable for use in planning their teaching strategies. The teachers also indicated that the material in the units was realistic and presented in a logical, unambiguous manner. However, a majority of the teachers indicated that the best use of the curriculum guide was for planning programs rather than developing teaching plans.

The findings from the third component of the field test phase of the project revealed few significant relationships between use of the national curriculum guides and student achievment on the criterion-referenced tests. The only relationship found to be significant and in the same direction for both stages of the field test was that the vocational agriculture teachers who valued the curriculum guides higher had classes with significantly higher achievement on the criterion referenced tests. In relation to the vocational agriculture teachers utilizing or not utilizing the curriculum guides for planning their teaching strategy, there was no significant difference in student achievement between the two groups.

CONCLUSIONS AND RECOMMENDATIONS

Many conclusions and recommendations can be made from the curriculum guide development phase and field test phase of this project. From the development phase it could be concluded that:

1. A high level of agreement exists among curriculum specialists, vocational teachers, and representatives from agricultural industry concerning the curriculum content necessary to prepare students to enter agribusiness occupations.

2. Prior to the project there was a lack of comprehensive curriculum guides for the emerging occupational areas in agribusiness, natural resources, and environmental protection.

3. Existing systems utilized in recording and describing curriculum documents were inadequate.

4. The three groups of reviewers (industry personnel, vocational teachers, and curriculum specialistes) were consistent in their reaction to the units and the guides in general.

From the field test phase of the project, the following conclusions were evident:

1. The state leaders were not consistent in dissemination of the national curriculum guides. Greater effort seemed to be put into disseminating the career preparation guides than the career awareness and exploration guides.

2. The national conference participants indicated very favorable reactions toward the guides.

3. The career preparation teachers found the curriculum guides to be of greater value for planning what to teach rather than how to teach.

4. The curriculum guides are technically correct and the units are presented in a format appropriate for teacher planning.

5. Most teacher perceived the national curriculum guides as having greatest value for planning programs rather than for teacher lesson planning.

6. Use of the national curriculum guides does not result in higher student achievement.

7. Supportive materials for career awareness and career exploration programs in agribusiness are not readily available.

8. The career preparation guides are of greatest value when the teachers perceive them as having value.

9. Revision of the national curriculum guides is not warranted at this time.

The recommendations from the curriculum development phase of the project include:

1. That national coordination be given to further development of task analyses and occupational descriptions in agribusiness, natural resources and environmental protection.

2. That national and regional efforts be made to develop instructional materials for teachers and students in those program areas where materials are very limited.

3. That the classification systems developed for use by this project be used as a model for classifying materials in agribusiness, natural resources and environmental protection in national information systems.

4. That educators make provisions in pre-service and in-service teacher education programs to develop knowledge and skills regarding use of various types of curriculum materials.

As for recommendations from the field test phase of the project, the following are presented:

1. Efforts should be made to develop adequate instructional materials in the agribusiness, natural resources, and environmental protection areas to support the career awareness and exploration programs.

2. Future development of instructional materials for the K-9 grade level should be in the form of in-depth instructional materials rather than curriculum guides.

3. In-service training should be made available for K-9 teachers utilizing the national curriculum guides.

4. The national curriculum guides should be used as guidelines for developing more in-depth curriculum materials at the regional, state, and local levels.

5. Teachers should be actively involved in future curriculum material development in the agribusiness, natural resources, and environmental protection areas.

6. Efforts in many states need to be renewed in providing adequate facilities and equipment for high quality agribusiness programs.

PROBLEM AREA

The curriculum project entitled "Curriculum Development Basic to the Training of Individuals for Employment in Agribusiness, Natural Resources and Environmental Protection (OEG-0-72-4677)" grew out of an expressed need by educators for adequate and accurate information for career awareness, exploration, and preparation programs in the agribusiness cluster. In May, 1971, agricultural leaders representing state supervisors, teacher educators, and classroom teachers in the agricultural business and industrial community met in Denver, Colorado at a national seminar, "Agricultural Education in Transition", to discuss the changing nature of the field. There was general agreement that growing emphasis on agribusiness, natural resources, and environmental protection occupations called for major curriculum changes and development of new curricula in agricultural education with concurrent changes in the preparation of agricultural education personnel.

In the proceedings of this seminar, Transitions in Agricultural Education Focusing on Agribusiness and Natural Resources Occupations, agribusiness education is broadly defined as:

> An organized instructional program involving the combination of the agricultural production and management operations and associated services, the manufacturing and distribution of agricultural equipment and supplies, the processing storage, marketing, and distribution of food, fiber and other agricultural commodities, the environmental protection and wise use of renewable natural resources including air, forest, water, soil, animal, marine, and plant life and recreational resources, also involving associated education and research in all these areas. (p. 9)

It was further stated that the general purpose of education in agribusiness and natural resources occupations was to:

> Provide high quality education for all persons in all geographic areas preparing for employment in, for those employed in, and for those continuing education for these occupations. It includes all instruction requiring knowledge and skills in the broad field of agribusiness and

natural resources, encompassing orientation, exploration beginning at the lower elementary levels, and specialized education at more advanced levels. Such instruction should be commensurate with the employment, technological, social and economic needs of these occupations and of persons who may prepare for careers in them. (p. 9)

The following figure illustrates the model of career education in agribusiness defined by participants in the seminar.

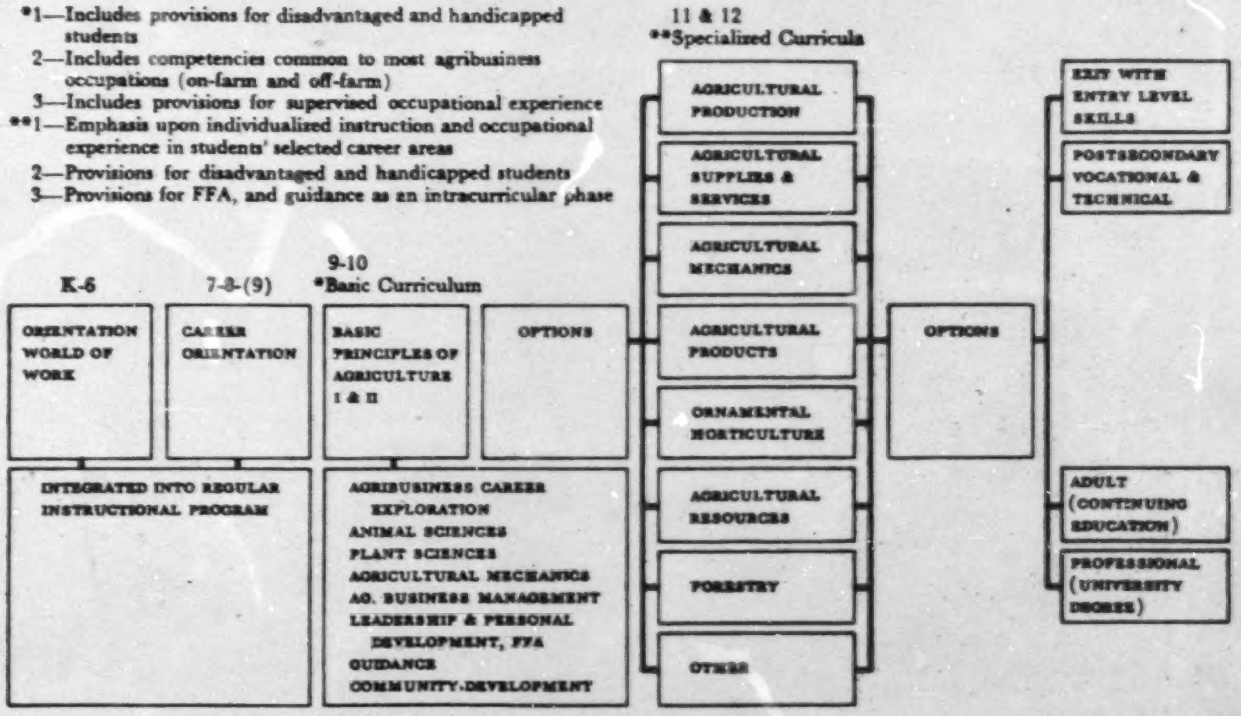

Figure 1—Career Education in Agribusiness

The model schematically illustrates some of the action steps suggested to carry out the purpose stated above. These suggested action steps included:

1. Provide world-of-work information and guidance in agribusiness and natural resources for students in K-6.
2. Provide information on these occupations for career orientation to students in junior high or middle schools.
3. Provide career exploration, information and guidance in these occupations for students in secondary schools.
4. Provide organized instruction and supervised occupational experience in basic plant and animal production, basic agricultural mechanics, basic leadership, and personal development to all ninth- and tenth grade students electing such instruction, both urban and rural.
5. Provide organized instruction and supervised occupational experience for eleventh- and twelfth grade students in the following basic areas of instruction: agricultural production; agricultural supplies; agricultural mechanics and equipment; agricultural marketing; ornamental horticulture; forestry; agricultural resources and recreation; environmental protection; and other agriculture.
6. Provide leadership and personal development through the FFA as an integral part of career education for all students enrolled in these agribusiness instructional areas at the secondary level. ("Transitions", 1971, pp. 10, 11)

The model and the related action steps were used as guidelines in developing the general purposes of the project which included:

1. To develop appropriate curriculum guides in agribusiness, natural resources and environmental protection which provide a coordinated educational program including career awareness, career exploration and preparation for a cluster of occupations.

2. To acquaint educational leadership in all states with the curriculum materials from this project and promote their use.

3. To disseminate copies of the curriculum materials to leaders of each state.

Accomplishment of these tasks constituted the curriculum guide development phase of the project.

As this phase of the project was implemented and the curriculum guides were developed, a validation procedure was utilized that included extensive review of each instructional unit in the curriculum guides by an advisory panel of supervisors, teacher educators, and curriculum development specialists in agricultural education as well as review by teachers and industry personnel who taught or worked in the specific occupational areas. Revision and rewriting of the materials were completed based upon the reactions of the panels of reviewers. However, upon completion of the curriculum guide development phase, an additional in-school evaluation of the curriculum guides was deemed necessary. A proposal was submitted and approved for an extension of the project in order to conduct an extensive nationwide field test effort in elementary and junior high schools for the career awareness and career exploration guides and in departments of vocational agriculture for the career preparation guides.

In summary, the curriculum project "Curriculum Development Basic to Training of Individuals for Employment in Agribusiness, Natural Resources, and Environmental Protection", had two major purposes:

1. Development of national curriculum guides to provide a coordinated educational program for grades K-12 in the areas of agribusiness, natural resources and environmental protection.

2. To conduct an in-depth field test of the ten national curriculum guides.

GOALS AND OBJECTIVES

The major goal of the curriculum guide development phase of the project was to provide curriculum guidelines in agribusiness, natural resources and environmental protection for teacher educators, administrators, guidance counselors, classroom teachers and others in education to facilitate the processes of career education at the various stages of career awareness, orientation, exploration and preparation.

In order to better achieve the major goal, the project had the following more specific objectives:

1. To develop guidelines which define the occupational areas to be included in the agribusiness, natural resources and environmental protection fields.

2. To define those existing and emerging occupations which are included within the career areas of agribusiness, natural resources and environmental protection.

3. To determine those occupations for which there is a need to develop curriculum at the career preparation level.

4. To survey the state of the art in development of curriculum guides and instructional materials and to evaluate relevance of the surveyed documents to the purposes of the project and their adequacy in meeting curriculum needs.

5. To develop a curriculum guide which defines activities and processes that can be infused into ongoing curricula at the K-6 grade levels to aid the teaching of developmental objectives for learners and promote an awareness of and motivation toward the world of work as it relates to this particular career cluster.

6. To develop a curriculum guide for orientation of students at the 7-9 grade levels to the occupational clustering and the exploration of careers in the agribusiness, natural resources and environmental protection cluster.

7. To develop eight career preparation curriculum guides--one for each of the eight major occupational areas: agricultural production, agricultural supplies and services, agricultural mechanics, agricultural products, ornamental horticulture,

agricultural resources, forestry, and environmental protection.

8. To plan and conduct a formative evaluation program which would determine the extent to which the guides meet the curriculum development needs of personnel responsible for developing curriculum and specific content for local programs.

9. To print copies of the guide, provide for dissemination of copies to curriculum personnel in all states, and to conduct an institute to promote the use of the guides.

The major goal of the field test phase of the project was to provide in-depth evaluative information concerning the ten curriculum guides.

In order to achieve the major goal of the field test phase the following more specific objectives were developed:

1. To monitor and describe the policies and procedures used by the states in disseminating the curriculum guides to teachers and the techniques and procedures used to acquaint teachers with and prepare them to use the curriculum guides.

2. To monitor and describe: (a) how teachers use the curriculum guides in making instructional decisions, (b) teachers' reactions to the adequacy and usefulness of the curriculum guides.

3. To assess achievement of students taught by teachers who have and have not used the curriculum guides for instructional decision making.

GENERAL PROJECT DESIGN AND PROCEDURES

Curriculum Guide Development Phase

The curriculum guide development phase of the project had four major task areas. The tasks were:

1. To identify the major agribusiness, natural resources and environmental protection occupational categories.

2. To determine the state of art in curriculum development in the various instructional categories of agribusiness, natural resources and environmental protection.

3. To develop curriculum guides for career education in agribusiness, natural resources and environmental protection for grades K-6, 7-9 and 10-12.

4. To print and disseminate copies of the guides to each of the 50 states.

Identification of Major Occupational Categories and Specific Occupations - Task I

The major occupational categories within the agribusiness, natural resources, and environmental protection areas were identified primarily through the use of the Definition of Agribusiness Competencies. Refer to Appendix A, pp. 1-7. Major sources used in identifying specific occupations included The Dictionary of Occupational Titles, Vocational Education and Occupations, and Classified Index of Industries and Occupations.

A list of approximately 3,500 specific occupations were reviewed and organized into the eight occupational groups: agricultural production; agricultural supplies and services; agricultural equipment and mechanics, agricultural products; ornamental horticulture; agricultural resources; forestry; and environmental protection. From this list the project staff identified approximately 400 occupations that were current and relevant to the project. This list was compared with the occupational study that was being conducted concurrently by the U. S. Departments of Agriculture, Commerce, and Labor, and the U. S. Office of Education. The two lists were found to be quite similar. The list was further refined by a review panel composed of twelve national advisory committee members representing industries related to the eight major career groups and four agricultural education supervisory staff personnel. Refer to Appendix A, pp. 8-10

for th: list of industry advisory committee members.

The members of the review panel were asked to review the list of occupations for completeness and representativeness of current or emerging occupations and indicate the level of education which would be appropriate preparation for a worker in those occupations. A copy of the occupations and rating forms used by the industry advisory committee is included in Appendix A, pp. 11-54.

Dictionary of Occupational Titles (DOT) numbers and U. S. Office of Education classification numbers were assigned to each occupation on the list. This list was then organized according to major job families in each of the eight occupational areas as follows: Production Agriculture - plant science, animal science, agricultural mechanization, and farm business management; Agricultural Supplies and Services - feeds, fertilizers, seeds, and chemicals; Agricultural Equipment and Mechanics - agricultural power service and repair, and assembly adjustment, repair and/or service of agricultural equipment; Agricultural Products - meats, poultry products, dairy products, fruits and vegetables; Ornamental Horticulture - aboriculture, floriculture, landscaping, nursery production, and turfgrass establishment and maintenance; Natural Resources - fish management, forestry, mining area restoration, outdoor recreation, range, soil, water, and wildlife management; Forestry - forest establishment, forest protection, tree harvesting, wood utilization, and Christmas tree production; and Environmental Protection - water treatment, wastewater treatment, and air pollution control.

The final activity in this task area was to define those careers which existed in significant levels and were of general interest. The occupational list then served as a basis for providing content and learning activities at the career awareness, exploration and preparation levels.

Determination of the State of the Art in Curriculum Development - Task II

The second major task area of the curriculum guide development phase of the project involved a determination of the state of the art. The three major sources used to identify extant curriculum guides were: Abstracts of Instructional Materials in Vocational and Technical Education (AIM); Abstracts of Research Materials in Vocational and Technical Education (ARM); and the information systems and related services of the Center for Vocational Education, The Ohio State University.

The AIM and ARM documents from 1967 through 1972 were searched using descriptors defined by the Center personnel

and project staff as relevant to classifying career education material into the eight occupational areas of production agriculture, agricultural supplies and services, agricultural equipment and mechanics, agricultural products (food processing), ornamental horticulture, agricultural resources, forestry and environmental protection. The search led to the compilation of over 950 abstracts found in AIM 1967-71 Bibliography Series Number 8 and the annual indices of AIM and ARM from 1967-72. The abstracts were pre-screened for appropriateness on the basis of the major descriptors, title and abstract content. Documents which were defined by the pre-screening as relevant to the project were coded, catalogued and a letter of request for a hard copy was sent to the source of the documents. (Refer to Appendix A, pp. 55-56.) Since the search for documents continued over a 6-month period of time, a second request was mailed to some of the institutions when it was determined that new documents had been completed and would be available later in the search period. In instances where the documents identified in AIM and ARM were out of print or were not readily available, microfiche copies of the documents were reviewed, and when appropriate, a full-scale photo copy of the microfiche was printed for more thorough in-house evaluation.

The curriculum laboratories and educational institutions that develop curriculum materials for state and local programs were also considered potent sources of curriculum documents. Letters of inquiry were sent to the directors of the curriculum laboratories and educational institutions requesting information about, or copies of, curriculum guides pertaining to career education in agribusiness, natural resources and environmental protection.

The director of the project also met with the Curriculum Materials Committee of the Agricultural Education Division of the American Vocational Association at the AVA Convention in December of 1972 to explain the search for material and solicit their help. This committee was most helpful in identifying existing curriculum guides. The publication entitled "A Description and Source Listing of Curriculum Materials in Agricultural Education", which is published annually by the committee, lists those materials which have been developed by the various vocational agriculture curriculum laboratories across the country. The publications for 1964-1973 were reviewed and relevant documents were identified. The Curriculum Materials Committee members continued to notify the project as new documents were developed.

In the fall of 1972, the project staff met with the Industry Advisory Committee (see Appendix A, pp. 8-10). The committee members identified those guides developed by industrial sponsorship designed to prepare employees for that

industry. Letters of inquiry were sent to the identified companies and corporations to locate commercial sources of materials. A final document, "Vocational Instructional Materials for Agriculture Available From Federal Agencies" was also searched and relevant materials were secured.

The search focused upon a specific type of educational document, curriculum guides. However, the documents which were received were of various design, ranging from very general outlines to student instructional materials. Even through a number of the documents secured and reviewed did not fall into the functional designation of curriculum guide, they often contained items which were useful in the development of curriculum guides.

For the emerging curriculum areas, the number of curriculum guides or curriculum materials of any type was quite limited. Agricultural Products (Food Processing) was an example of a program area where curriculum development apparently had been quite limited. In order to acquire materials in the curriculum development areas where less development had been completed, documents such as teacher's guides and materials designed for instructional use were also collected and reviewed.

The educational materials were classified into five categories to more specifically define their nature. The categories were based upon the apparent intended use of the document. The five categories were:

1. Curriculum Guide
2. Teacher's Guide
3. Teacher and Student Guide (Combination)
4. Student Manual With Teacher Direction
5. Self-Study Manual for Students

In addition to use of these five categories, the project staff defined 28 other criteria for classifying curriculum documents and organized them into a review instrument. The instrument was presented to the National Advisory Committee at the AVA Convention in December of 1972. Refer to Appendix A, p. 57 for a listing of the National Advisory Committee members. The Advisory Committee members used the instrument to rate several instructional documents that had been rated previously by the project staff. Results of the ratings by both groups were compared to determine how nearly the ratings of documents by the two groups agreed. From this critique, 20 elements were selected to be included in the review instrument. Refer to Appendix A, pp. 58-59 for illustrations

of the review instrument and key. The data from the review of each document was recorded on a quick-sort index file card and the cards catalogued into the eight program areas. An example of the cards is shown in Appendix A, p. 60.

One of the most important aspects of collecting and reviewing extant curriculum guides was to identify the guides or elements of guides which would meet needs of the project staff in developing each of the ten proposed curriculum guides. The National Advisory Committee of educators reviewed with the project staff the elements which were most appropriate to be included in the ten guides. Those elements were included in the review instrument. The documents were then evaluated for each element and index records were made and filed for each document.

A total of 526 documents were reviewed by the project staff. The curriculum materials designed for use in career awareness and career exploration programs were evaluated on the basis of 28 criteria and the career preparation materials were reviewed on the basis of 20 criteria. Refer to Appendix A, pp. 60-113 for the complete listing of the 526 documents and the summary of the document review.

Development and Formative Evaluation of the Curriculum Guides - Task III

Development of the two guides for career awareness, K-6 and career exploration 7-9 was done under arrangement with Eastern Illinois University. A complete report of the development of those two guides is included in Appendix A, pp. 114-184. Therefore, this segment of the report is limited to a description of the development of the eight guides for career preparation.

Two types of information were developed for each of the eight career preparation guides. The first type of information pertained to administrative planning and development for local programs of specialized vocational training. This information included:

1. The use of the guide
2. Organization of instructional units
3. The curriculum content
4. Format of the units
5. Recommended facilities and equipment
6. Teacher requirement and responsibilities

7. Scientific and technical societies and trade associations

8. Employment opportunities in the occupational area

9. Procedures used to validate the content

The second type of information pertained to teaching activities. The suggested curriculum was separated into discreet instructional units, each based upon several closely related student performance objectives. Each instructional unit has seven parts:

1. Unit concept

2. Student performance objectives

3. Instructional areas

4. Examples of student learning activities

5. Examples of processes to evaluate student performance

6. Instructional materials and equipment

7. Examples of supporting references

The format for the instructional units was based upon suggestions from the National Advisory Committee members at the meeting held on December 1, 1972 at Chicago, Illinois.

As a means of conducting a formative evaluation of the guides, an instrument was developed to be used by review panel members. Three versions of the instruments were developed: one for use by industry personnel, one for curriculum specialists, and one for use by vocational teachers. A list of criterion statements were developed for the three versions of the instrument and reviewed by the National Advisory Committee. The committee's review indicated that 81% of the criterion statements for the instrument were rated appropriate as written, 5% were not appropriate and were deleted, and 14% were rated appropriate after rewriting. A copy of the final version of the instruments is included in Appendix A, pp. 185-190. The final version of the evaluation instrument asked for a yes/no response as to the adequacy and usefulness of each of the parts of the guides. Each response was open-ended and further specific responses were requested when an inadequacy was noted.

Upon completion of the first draft, the instructional units in each of the eight guides were reviewed by members of three groups. The three groups of reviewers were industry

personnel, curriculum specialists from state curriculum laboratories and vocational agriculture teachers. Industry personnel and teachers were selected to review those materials that were developed for the occupational area in which they worked or taught. The response sought from the industry personnel was whether the content of the guides defined adequate and appropriate processes, material and outcomes to prepare students for entry level employment. While vocational teachers were asked to respond to similar criteria as the industry personnel, additional items on the teacher's version were included to seek an evaluation of the guides in relation to their usefulness for planning local instructional programs.

As an example of this review process, the unit pertaining to meats processing within the food processing curriculum was reviewed by five industry personnel, two teachers and a supervisor of specialized vocational programs in food processing at an area vocational school.

With the large demands on teachers' time in their vocational agriculture programs, it was assumed that the bulk of the curriculum materials development should and most likely would be conducted by state or regional curriculum laboratories. Therefore, the curriculum specialists located at these laboratories constituted the primary target population for the national guides.

A group of thirteen curriculum specialists were selected to test the usefulness of the developed materials to state personnel responsible for curriculum development. Since there were a large number of units, a strategy was developed to set the number of units to be evaluated by each of the thirteen personnel at 32. Four units were selected from each of the eight occupational areas to obtain thirty-two units for each curriculum specialist. Each of the eight occupational areas have several major divisions of content. As much as possible, the four units selected for each curriculum specialist to review were representative of these divisions within each occupational area.

As groups of units were completed by the project staff, they were mailed to the curriculum specialists. This process provided a manageable work load for the reviewers and feedback to the project staff. Upon return of the units, suggested revisions were considered in rewriting the units and in other units being written.

This strategy resulted in evaluation by curriculum specialists of over 90% of the 400 units with over 10% of the units evaluated by two or more personnel. Responses from the reviewers were used to determine the nature of changes necessary in preparing the final field test copy of the guides.

Dissemination of the Guides - Task IV

Initial dissemination of the curriculum guides occurred at a conference for agricultural education leaders which was conducted to identify key change agent personnel in the various states and assist them in developing a dissemination strategy for their states. Personnel attending the conference were identified through the state director of vocational education in each state. A letter was sent to each state director of vocational education asking him to secure the nomination of two individuals. The nominees were to meet the following criteria:

1. State department or teacher education personnel with responsibility in leadership roles in agricultural education for the secondary level.

2. Professional capabilities and responsibilities for directing curriculum planning or changes within the state (someone who is in a position for actually doing or seeing that it is done).

The National Conference on Dissemination of Career Education Curriculum Guides in Agribusiness, Natural Resources, and Environmental Protection was held May 13-17, 1974 at the Fawcett Center for Tomorrow, The Ohio State University. A total of 104 personnel attended representing 48 states; Maine and Hawaii did not have representatives in attendance. A listing of the conference participants is included in Appendix A, pp. 192-200. Two complimentary copies of each of the 10 guides were provided to each state. Copies of each of the ten curriculum guides are included with this report. A copy of the conference program is included in Appendix A, pp. 201-206. Work sheets were provided those in attendance and used during the conference to develop dissemination plans and processes for use in the home states. At the end of the conference, the participants submitted a plan for dissemination and use of the guides.

Curriculum Guide Field Test Phase

As was noted previously the project had two major phases (1) development of the ten curriculum guides and (2) an in-depth field test of the guides. The following section of this report includes the rationale, design, and procedures utilized in the field test of the ten national curriculum guides.

Rationale for the Field Test of the Curriculum Guides

The rationale upon which the field test strategy was based is as follows:

Curriculum Guides
Designed
to
Aid Teachers to Make
Instructional Decisions About:

Type of Course to be Offered

Objectives of Instruction

Instructional Resources and Media

Instructional Techniques and Activities

Evaluation Procedures

That
Lead
to
Student Achievement

For purposes of the in-school field test, the ultimate purpose of the curriculum guides was assumed to be to improve instruction which in turn leads to observable changes in students' behavior. A basic premise of evaluation design was that the extent to which the curriculum guides impact on student achievement is directly related to the extent to which the curriculum guides are used by teachers in making instructional decisions.

Design and Procedures
for the Field Test

The first component of the field test, which involved a monitoring of the policies and procedures used by personnel in the various states in disseminating the curriculum guides, was inititated in May, 1974 during the National Conference on Dissemination of Career Education Curriculum Guides in Agribusiness, Natural Resources, and Environmental Protection. During the conference, the participating state supervisors, teacher educators and other personnel with leadership responsibility for curriculum change in the various states indicated their tentative plans for dissemination of the curriculum guides as well as planned procedures for orienting teachers to and preparing them to use the curriculum guides. In order to provide this information, the conference participants completed the information form found in Appendix B, pp. 1-10. This part of the field test was completed in the summer of 1975 with a follow-up questionnaire on which the conference participants indicated their actual dissemination activities since the conference. Correspondence and the instrument used in this activity are found in Appendix B, pp. 11-17.

The second component of the field test, which included a monitoring of teachers reactions to the adequacy and usefulness of the curriculum guides, was also initiated at the National Conference on Dissemination of Career Education Curriculum Guides in Agribusiness, Natural Resources, and Environmental Protection. This component of the field test was divided into two stages. The first stage was completed in the spring of 1975 with the second stage completed in the autumn of 1975. At the national conference and in the following weeks, the project staff made a concerted effort to obtain names of teachers in the various states who might be interested in participating in the field test. Refer to Appendix B, pp. 18-21 for copies of the correspondence and information forms utilized. Teachers indicated by conference participants or other state leaders in the various states as being potential participants in the field test were contacted and provided with informative material concerning the curriculum guides and the field test and were formally asked to participate. See Appendix B, pp. 22-43 for copies of correspondence and informative material sent to teachers nominated by state leaders. Those teachers desiring to participate in the field test were provided information forms on which they could indicate the context within which the curriculum guide would be used, i.e., teachers characteristics and qualifications, type of course, etc. and the unit that they desired to incorporate into their curriculum. Refer to Appendix B, pp. 22-43 for illustrations of the teacher information forms. In addition, each teacher's superintendent or vocational director was mailed a letter

explaining the project and a card on which he could indicate approval for his teacher(s) to participate (see Appendix B, pp. 44-46). In this phase of the field test, the project staff developed instruments to monitor the teachers' reactions to the adequacy and usefulness of the curriculum guides. These instruments along with the results of an item analysis used to determine the reliability of each section of the instruments are illustrated in Appendix B, pp. 47-57. Upon completion of the teaching of the selected unit, each teacher utilizing the national curriculum guides for planning their teaching strategy completed the information forms and returned them to the project office. The same procedures were utilized in recruiting teachers and conducting the autumn stage of the field test as were used in the spring stage with the exception that additional career preparation teachers were recruited at the Ohio Vocational Agriculture Teacher's Conference in July, 1975.

The third component of the field test was implemented concurrently with the second component. The third component of the field test was an assessment of student achievement in classes whose teachers did or did not use the curriculum guides for instructional decision-making. Student achievement was assessed in terms of behavioral outcomes specified in the instructional objectives of the selected units. In this part of the field test, criterion-referenced tests for each unit selected by the project staff for use in the field test were developed and pilot tested to obtain reliability and validity measures. Development and pilot testing of these instruments will be further described in the next section of this report. Those teachers indicating a desire to participate in the field test were asked to assume the following responsibilities in addition to those completed during the second component.

1. Select one of the available units to incorporate into their curriculum
2. Administer pretests provided by the project staff
3. Teach the selected unit
4. Administer posttests provided by the project staff
5. Complete an information form describing their planning and teaching activities (refer to Appendix B, pp. 58-60).

Prior to the in-school field test, each career preparation teacher (grades 10-12) was randomly assigned to one of two groups. One group utilized the appropriate curriculum guide for planning their teaching strategy while members of the second group were provided only with the instructional

objectives. In contrast, all career awareness and career exploration teachers utilized the national curriculum guides. Therefore, there were comparison groups for the field test of the career preparation guides (grades 10-12) and no comparison groups for the field test of the career awareness and career exploration (grades K-9) guides. Examples of each type of correspondence with the teachers during the spring and autumn field tests are included in Appendix B, pp. 61-78 for the career awareness and exploration teachers and in Appendix B, pp. 79-108 for the career preparation teachers.

Development of Criterion-Referenced Tests

Criterion-referenced tests (Glaser and Nitko, 1971) for the purpose of assessing student achievement were developed for units selected for use in the field test. For the career preparation guides (grades 10-12), 72 tests based upon the student performance objectives found at the beginning of the various instructional units were developed by the project staff. Because some of the instructional units for which tests were developed were found in more than one curriculum guide, tests were available for 92 different instructional units. For the career awareness and career exploration guides, 12 criterion-referenced tests were developed for selected units. In addition to the cognitive tests developed to assess the students' knowledge of the subject matter, affective tests were developed for the units in the career awareness and career exploration guides based upon the career development concepts in the units. The affective tests were developed for assessing the students' attitudes and appreciations concerning the world of work. In developing the criterion-referenced tests the project staff utilized numerous references including Baker and Schutz (1971) and Popham (1971).

After the tests were developed, the career preparation tests were reviewed for content validity by vocational agriculture teachers in Ohio who had taught the unit during the previous year. The teachers were asked to indicate those test items appropriate for the unit area, whether the test items were technically correct, and those test items which should be added or deleted.

The teachers were also asked to administer the tests to their students who had received instruction in the unit in the previous year. Prior to pilot testing, each teacher's vocational director or principal was asked to return an approval form to the project office. Approximately 50 percent of the tests were administered by the project staff members with the remaining tests administered by the teachers. The first group of tests developed were pilot tested during October and November, 1974 with the remainder pilot tested during May, 1975. Appendix B, pp. 109-111 lists the vocational agriculture teachers who participated in the pilot testing.

The career awareness and career exploration units were pilot tested in Ohio in elementary and junior high schools. Teachers listed in Appendix B, p. 112 participated in the pilot test. Elementary and junior high school principals were asked to approve participation of the teachers and students in their schools prior to the pilot testing. The teachers were then asked to assume the following responsibilities:

1. select one of the available units to teach
2. teach the unit
3. test their students
4. complete an evaluation form concerning the tests and conduct of the field test (refer to Appendix B, pp. 113-114)

Pilot testing of the career awareness and career exploration tests was completed in October and November, 1974.

Programs and computer facilities of the Office of Evaluation, The Ohio State University, were utilized to obtain an item analysis of each item and test. Test reliability was estimated by calculating Kuder-Richardson 21 internal consistency coefficients (Kerlinger, 1973, Stanley, 1964). Information provided for each item also included relative difficulty, phi coefficient, point biserial coefficient and discrimination index. Interpretation of those terms is included in Appendices C and D. Revision of each test was accomplished based upon the data yielded by the item analysis and the comments of the pilot test teachers.

Student performance objectives for each unit and the revised criterion-referenced tests are presented in Appendices C and D. In addition, a table follows each test which presents the correct test answers and results of the final item analysis.

FINDINGS OF THE FIELD TEST

Component I - Findings

The findings of the first component of the field test of the national curriculum guides encompass two major areas: (1) the results of the survey at the National Conference on Dissemination of Career Education Curriculum Guides in Agribusiness, Natural Resource and Environmental Protection (May, 1974) pertaining to the participants' perceived orientation and dissemination plans in their states and (2) the results of the follow-up survey conducted in May, 1975 to determine the actual dissemination activities of the conference participants.

Briefly, some of the plans for disseminating the curriculum guides as indicated by the national conference participants will be reported. A majority of the participants foresaw use of the career awareness and career exploration guides as planning aids for developing career education curricula by elementary and junior high school teachers as well as aids for planning in-service activities for those teachers. To a lesser extent, they indicated potential use of the curriculum guides for developing additional instructional materials and planning and conducting pre-service teacher education programs. In general, the participants planned to inform a variety of individuals in leadership positions in their states as to the content and availability of the curriculum guides. However, a majority felt that in-service workshops would be the strategy most likely to be used in disseminating the guides. Most participants indicated that it would take from 14 to 24 months to disseminate the career awareness and career exploration guides in their states.

The participants' plans concerning dissemination of the career preparation guides involved a variety of procedures. Among the possible uses of the guides, the participants listed: (1) use for expanding the concept of in-depth specialized agribusiness programs, (2) planning and developing courses of study for specialized agribusiness programs, (3) lesson plan development by teachers, (4) planning and developing pre-service teacher education programs in agriculture, and (5) planning and conducting in-service workshops for curriculum development activities by teachers. A majority of the participants indicated use of in-service workshops, annual state vocational agriculture teacher conferences, and local or area curriculum development workshops as being the most viable means of disseminating the guides. The complete summary of the results of the survey completed by each state's representatives at the National Conference on Dissemination of Career Education Curriculum Guides in Agribusiness,

Natural Resources, and Environmental Protection is found in Appendix B, pp. 115-123.

The results of the dissemination phase of the project are based upon responses to the follow-up survey conducted during May of 1975. Eighty-seven of the conference participants returned completed survey forms. (Refer to Appendix B, pp. 11-17 for an illustration of the survey form.) A majority of the participants shared the career awareness and career exploration guides with the following individuals: (1) state supervisors, (2) the state director of agricultural education, and (3) teacher educators in agricultural education. Approximately one-fourth of the participants shared the guides with their state director of vocational education while approximately one-third shared the guides with their state career education director. Two of the participants who responded indicated they had shared the guides with their state director of education. Other than sharing the curriculum guides with other individuals, approximately one-half of the participants reported that they promoted use of the guides for developing instructional materials for career awareness and career exploration curricula as well as promoting use of the curriculum guides in existing career education programs.

As for their general reaction to the value of the career awareness and career exploration curriculum guides, over 90 percent of the national conference participants felt that the guides were of moderate or great value for the following purposes: (a) implementing career education programs in agribusiness in elementary and junior high school, (b) familiarizing elementary and junior high school teachers with career education concepts, and (c) serving as a general structure or scheme for developing career education curricula in areas other than agribusiness.

The national conference participants were also active in disseminating the vocational preparation guides. A majority of the participants indicated they had shared the vocational preparation guides with their state supervisory staff in agricultural education and vocational agriculture teachers in their state. To a lesser extent, the guides were shared with their state supervisory staff in vocational education, other state department of education personnel, and local supervisors in agricultural education. A majority of the participants also reported that they had promoted use of the vocational preparation guides in developing specialized vocational agriculture programs in their state and in preservice and in-service programs for vocational agriculture teachers.

The participants' ratings of the guide for various purposes revealed that they perceived the guides' greatest value in the following areas:

1. Assisting in the development of state curriculum guides.

2. Assisting local administrators in planning and developing new programs.

3. Assisting teachers in updating present programs.

4. Assisting teachers in developing lesson plans.

To a lesser extent, the participants regarded the vocational preparation guides as being of value for:

1. Assisting state and local supervisors in updating present programs and developing new programs.

2. Assisting teacher educators in updating and improving courses related to curriculum planning.

Many of the participants provided additional reactions to the guides. One commented "We've looked very closely at several of the guides. Aside from some minor changes in format, we're greatly impressed by the comprehensive treatment. We find it easy to expand upon the examples of the occupations you have provided." Another indicated that the national guides were proving to be a valuable supplement to their previously developed state curriculum guides. Another participant said "We made the curriculum guides available to agriculture teachers in selected teaching centers for testing. These teachers have reported a great deal of success. They have had a rewarding experience." Although the participants did not add negative comments concerning the national guides, in general those with less favorable reactions had already developed state curriculum guides and were promoting their use. Reflecting this point, one participant stated "We haven't used the guides to any great extent. Remember, we developed our state guides just one year prior to the national guides, thus our emphasis was getting people introduced to and using the state guides." Complete responses to the follow-up survey are included in Appendix B, pp. 124-134.

Component II - Findings

Career Awareness and Career Exploration Curriculum Guides

The findings from the field test of the career awareness and career exploration curriculum guides include data from 35 field test sites in four states. Refer to Appendix B,

pp. 135-137 for a list of the participating teachers. All teachers participating in the evaluation of the career awareness and career exploration guides utilized the appropriate guide for planning and teaching their selected unit. With this exception, the types of field test data parallel that collected from the teachers involved in the field test of the career preparation guides.

The teachers indicated that the career awareness and career exploration guides were used to the greatest extent for the following purposes:

1. Determining the objectives or behavioral outcomes desired from instruction.

2. Selecting content or subject matter.

3. Selecting student activities.

To a lesser extent the teachers used the curriculum guides for determining techniques and procedures for evaluating student achievement and determining needed instructional materials and equipment. The sections of the units in the curriculum guides with lowest use ratings included: (1) locating teacher reference materials for use while lesson planning and (2) locating resource materials for student use.

The teachers' ratings of the value of the various parts of the unit paralleled their extent of use ratings. In general, those sections of the unit which were used extensively were also rated as being of greater value in planning and teaching the unit. Another finding was that teachers in the lower grade levels tended to utilize the curriculum guides to a greater extent and valued them higher.

The elementary and junior high teachers also reacted to a list of statements concerning the curriculum guides and the units they taught. Refer to Appendix B, pp. 138-142 for a complete summary of the teachers' responses. The teachers reacted highly favorable toward the following statements:

1. The suggested student learning activities in the guide tended to stimulate my thinking to determine other activites I could use.

2. The evaluation activities are not too complicated.

3. The career development concepts covered in the guide are broken down into logical units.

Reactions to the following statements were less favorable:

1. The objectives clearly state the performance expected of the students.

2. The content areas in the "Instructional Activities" section (based on the career development concepts) are specific enough for planning a unit.

3. The student activities were realistic for use in our local program.

4. The evaluation activities suggested are adequate to determine how well a student can perform a task.

5. The suggested learning activities and evaluation activities are very helpful in planning lessons.

6. The units in the guides are not ambiguous.

7. I would recommend this guide to other teachers for use in planning their teaching.

Areas of dissatisfaction with the career awareness and career exploration guides were revealed by negative reactions to the following statements:

1. Our school has adequate equipment for teaching the unit.

2. The instructional materials needed for the unit are available in our school.

3. The resources cited in the instructional units are readily available.

4. The curriculum guide contains enough content material.

5. The resource section at the end of the unit was very helpful in planning to teach.

6. The guide will be very helpful for use when determining equipment and material needs for my classroom.

The teachers' reactions to the following statements appear to have many implications for future curriculum development in agribusiness for grades K-9. The teachers generally agreed that:

1. They would prefer instructional materials to teach from rather than a curriculum guide for use in planning for teaching.

2. The best use of the curriculum guide is for planning programs rather than developing teaching plans.

The following comments by elementary teachers who participated in the project summarize many of the reactions to the career awareness guide. In reference to the Peanut Butter Maker unit one kindergarten teacher stated, "This unit was so very much fun and exciting for kindergarteners. I shall continue to teach this each year and add to it? It was really fun!" A first grade teacher who had taught the unit Park Ranger Naturalist commented, "The Park Ranger Unit was self-motivating because of its nature and relevance. Also it was very timely. The children enjoyed it immensely, and the unit was highly successful." However, one second grade teacher reflected the desire of many teachers for in-depth materials to teach from rather than a curriculum guide for planning. In reference to the unit entitled The Florist, she stated "The time spent in preparing this unit for my class to use was more than I had anticipated...I feel the unit was very superficial and anyone teaching it has to put much of their own time and materials into it in order to make it a presentable unit." Evidently, teachers willing and/or able to put the time and effort into fully developing a unit from the career awareness guide had very rewarding experiences.

Career Preparation Guides

One-hundred and thirty seven vocational agriculture teachers returned complete information during the field test of the career preparation guides with 56 of those participating in the spring of 1975 and the remaining 81 participating in the autumn of 1975. The teachers represented vocational agriculture departments in thirty states. Fifty-four different instructional units from the curriculum guides were field tested with each of the eight career preparation guides utilized by one or more teachers. Prior to each stage of the field test the teachers were randomly divided into two groups. Teachers in one group were provided with the appropriate curriculum guide for use in planning and teaching the selected instructional unit while the second group received only the objectives from the selected instructional unit. A complete list of the career preparation teachers involved in the field test is included in Appendix B, pp. 143-150.

The teachers using the curriculum guides were instructed to use them in the same manner as they would any other guide. The teachers not provided the curriculum guide were instructed to teach to the objectives they were provided, using their normal teaching methods and procedures. Upon completion of the field test which involved: (1) selecting an available instructional unit to incorporate into his curriculum (2) administering a pretest to the students, (3) teaching the

selected unit, and (4) administering a posttest to the students, each teacher completed an information form concerning his planning and teaching activities. In addition, teachers receiving the curriculum guide for use while planning and teaching completed an additional schedule of items concerning (1) the extent to which the guide was utilized, (2) their perceived value of the guide, (3) usefulness of sections of the guide other than the units and (4) their reaction to the guide and the unit. A complete summary of the teachers' responses is included in Appendix B, pp. 151-157.

In both the spring and autumn stages of the field test the teachers who received the career preparation guides revealed that the curriculum guides were used to the greatest extent for: (1) determining the objectives or behavioral outcomes desired from instruction, (2) selecting content or subject matter, and (3) determining what instructional materials and equipment are needed. Concurrently, the teachers indicated that the curriculum guides had the greatest value for the same activities. To a lesser extent, the guides were used for selecting student activities, determining student evaluation techniques, and locating teacher and student resource materials. The guides were also rated as being of less value for these activities.

The teachers provided their reactions to the guide by indicating their level of agreement or disagreement to twenty-one items concerning the curriculum guide and the unit selected for teaching. The teachers' reactions to the guide were generally very favorable. As for their reactions to specific items, over 80 percent of the teachers agreed with the following statements:

1. The objectives clearly state the performance(s) expected of students.

2. The content area in the "Instructional Areas" section of the unit is specific enough for planning a unit.

3. The material in the guide is technically correct.

4. The student activities were realistic for use in our local program.

5. The suggested student learning activities in the guide tended to stimulate my thinking to determine other activities I could use.

6. The evaluation techniques are not too complicated.

7. The guide will be very helpful for use when determining equipment and material needs for our department.

8. The material covered in the guide is broken down into logical units.

9. The units in this guide are not ambiguous.

10. I would recommend this guide to other teachers for use in planning their teaching.

To a lesser extent, the teachers in both stages of the field test agreed with the following statements:

1. The study areas are listed in manageable sequence for planning teaching strategy.

2. The curriculum guide contains enough content material to be very useful.

3. The evaluation techniques suggested are adequate in order to determine how well a student can perform a task.

4. Our school has most of the equipment suggested for teaching the unit.

5. The bibliography at the end of the unit was helpful in planning to teach.

6. The guide I used is superior to other available guides I have used.

Teachers in both stages of the field test tended to disagree most with the following statements:

1. The instructional materials recommended in the unit are available in our school.

2. The teacher references cited in the instructional units are readily available in our school or district.

The teachers' reaction to two additional statements should be noted. Over 60% of the teachers agreed with the statement, "I think the best use of the curriculum guide is for planning programs rather than developing teacher plans." Teachers' responses to the statement, "I would rather have instructional materials to teach from rather than the curriculum guides for planning what to teach", indicated a general lack of consensus on the item.

As for sections of the guide other than the instructional units, the teachers indicated that the recommended facilities and equipment and teacher requirements and responsibilities sections were moderately useful while the lists of technical societies and associations and employment opportunities sections were less useful.

Component III - Findings

The findings from this component of the field test pertain to the planning and teaching activities of the teachers as well as student achievement on the criterion-referenced tests. Before discussing the findings, a brief description of how student achievement was measured will be presented.

Analysis of the data was completed considering each teacher's class as the experimental unit or subject rather than the individual student. The students' raw scores were transformed into standard scores before analysis which provided a means for equating the various tests and consequently allowing comparisons between classes. Specifically, each student's test score was converted to a standard score utilizing a test mean of 500 and a standard deviation of 100. As an example, the following table presents some of the results for the students who had instruction in the unit Livestock Selection during the autumn stage of the field test.

TABLE 1

Selected Raw Scores, Frequencies, and Standard Scores for the Unit Livestock Selection.

Raw Score	Frequency	Standard Score
43	1	678.1
40	4	638.2
36	5	585.1
30	2	505.3
28	7	478.7
22	2	398.2

As can be seen in Table 1, a raw score of 43 results in a standard score of 678.1. On this test, one student achieved this score. In contrast seven students achieved a score of 28 which converts to a standard score of 478.7.

Once the scores for each student on the pretest and corresponding posttest had been computed and transformed to standard scores, the mean of the standard scores for the pretest and posttest of each class was computed. Student achievement, therefore, was considered to be the difference between the pretest mean of each class and the corresponding posttest mean. Refer to Appendix B, pp. 185-179 for complete data for each career awareness, exploration, and preparation class.

Career Awareness and Career Exploration

Analysis of the data concerning the career awareness and career exploration curriculum guides was completed in light of the fact that all teachers utilized the appropriate curriculum guide in planning and teaching their selected unit. With this exception the career awareness, exploration, and career preparation data were analyzed in the same manner.

A planning and teaching index was developed from the information provided by each teacher concerning the methods and procedures used in planning and teaching the instructional unit. The index was developed from the following items:

1. Whether or not the teacher developed specific student performance objectives for the unit.
2. Number of references used by the teacher and the students.
3. Number of field trips.
4. Number of resource persons utilized.
5. Number of learning activities, demonstrations, experiments, and laboratory exercises conducted.
6. Number of different evaluation techniques used.

In the first stage of the field test, those teachers with higher planning and teaching indices had significantly higher student achievement. Although this trend was also apparent in the second stage of the field test, the results were not significant.

Pearson product moment coefficients for the teachers in each stage of the field test were calculated to describe the relationships between various teacher activities and class characteristics and student achievement on the criterion-referenced tests. Table 2 provides the results of the analyses.

TABLE 2

Relationships Between Selected Variables and Student Achievement (K-9).

Variable	Spring (n = 23) Pearson Correlation Coefficient	Sig.	Autumn (n = 12) Pearson Correlation Coefficient	Sig.
Planning-Teaching Index	0.41	0.06	0.13	0.35
Extent of Use of the Curriculum Guide	0.74	0.001*	0.16	0.32
Value Rating of the Curriculum Guide	0.53	0.03*	-0.13	0.36
Reaction to the Curriculum Guide	-0.41	0.11	0.30	0.18
Grade Level	-0.38	0.04*	-0.35	0.14
Planning Time	-0.02	0.48	0.69	0.01*
Teaching Time	0.31	0.11	-0.07	0.42

As can be seen in Table 2, there were no relationships which were significant and in the same direction in both stages of the field test. However, in both stages of the field test those teachers who had a higher planning and teaching index and those teachers using the curriculum guides to a greater extent tended to have higher student achievement on the criterion-referenced tests. In addition, teachers in the lower grade levels tended to have higher student achievement although the results again were not statistically significant ($p > .05$) for both stages of the field test.

Career Preparation

A planning and teaching index was developed as before for each teacher and correlated with the students' achievement on the criterion-referenced tests. In both spring and autumn stages of the field test a t-test revealed there was no significant difference ($p > .05$) between the planning and teaching activities of teachers who received the curriculum guide and teachers who did not.

Analysis of the data in relation to student achievement revealed no significant differences between the classes of teachers utilizing the curriculum guides and those who did not. In both the spring and autumn stages of the field test, an analysis of covariance utilizing the posttest mean of the classes as the dependent variable and the pretest means of the classes as the covariate did not reveal significant differences ($p > .05$) between the two groups. (see Tables 3,4,5 and 6)

TABLE 3

Means and Standard Deviations of Career Preparation Classes - Spring Field Test

Group	N	Pretest Mean	Pretest Standard Deviation	Posttest Mean	Posttest Standard Deviation
No Guide	25	473.2*	39.6	538.2	37.8
Guide	31	472.3	34.4	523.4	40.4
Total	56				

*Means are in Standard Score

TABLE 4

Analysis of Covariance: Posttest Mean with Pretest Mean as Covariate (Spring Field Test)

Source	Sum of Squares	df	Mean Square	F
Covariate Pretest Mean	598.36	1	598.36	0.38
Main Effect Group	3011.49	1	3011.49	1.93
Explained	3609.88	2	1804.94	1.16
Residual	82776.19	53	1561.82	
Total	86386.06	55		

TABLE 5

Means and Standard Deviations of Career Preparation Classes-Autumn Field Test

Group	N	Pretest Mean	Pretest Standard Deviation	Posttest Mean	Posttest Standard Deviation
No Guide	34	457.7*	35.9	542.3	35.8
Guide	47	463.1	41.4	538.8	46.3
Total	81				

*Means are in Standard Score

TABLE 6

Analysis of Covariance: Posttest Mean with Pretest Mean as Covariate (Autumn Field Test)

Source	Sum of Squares	df	Mean Square	F
Covariate Pretest Mean	4032.73	1	4032.73	2.30
Main Effect Group	412.24	1	412.24	0.24
Explained	4445.00	2	2222.50	1.27
Residual	136840.25	78	1754.36	
Total	141285.25	80		

Additional covariates such as grade level and field test sites (Ohio or other state) were also entered into an analysis of covariance to determine whether a significant difference existed between the two groups. In each case the results of the analysis showed no significant difference ($p > .05$) between the groups.

For the teachers utilizing the national curriculum guides in each stage of the field test, Pearson product moment coefficients indicated in Table 7 were calculated to describe the relationships between selected variables and student achievement on the criterion-referenced tests.

TABLE 7

Relationships Between Selected Variables and Student Achievement (10-12).

Variable	Spring (n = 31) Pearson Correlation Coefficient	Sig.	Autumn (n = 47) Pearson Correlation Coefficient	Sig.
Planning-Teaching Index (Guide Teachers)	0.03	0.42	-0.16	0.14
Extent of Use of the Curriculum Guide	0.24	0.18	0.13	0.21
Value Rating of the Curriculum Guide	0.38	0.02*	0.24	0.05*
Reaction to the Curriculum Guide	-0.30	0.08	-0.07	0.36
Grade Level	-0.26	0.03*	0.09	0.23
Planning Time	0.20	0.16	-0.05	0.38
Teaching Time	0.40	0.02*	0.02	0.46
Instructional Area (Production or Other)	-0.25	0.04*	0.19	0.05*

Of the relationships investigated, the only one that was significant for both stages of the field test and in the same direction was the teachers' value ratings of the curriculum guide. Those teachers who valued the curriculum guide higher had classes with significantly higher student achievement. Other variables with significant relationships were found not to be consistent in both stages of the field test.

CONCLUSIONS

Curriculum Guide Development Phase

The advisory committee members representing supervision, teacher education, curriculum specialists, vocational teachers, and agricultural industries indicated a high level of agreement concerning the description of the agribusiness industry. In this description, the following major occupational areas were identified: production agriculture, agricultural supplies and services, agricultural equipment and mechanics, agricultural products (food processing), ornamental horticulture, natural resources, forestry, and environmental protection. The advisory committee members also agreed that the curriculum content in the curriculum guides was representative of the educational programs needed in each of the occupational areas.

Among the eight agribusiness areas, the amount and kinds of instructional material available from one occupational area to another varied to a great extent. There was generally a lack of comprehensive curriculum guides for the emerging occupational areas. With the exception of the traditional areas of production agriculture, agricultural mechanics, and ornamental horticulture, supportive materials for the specialized agribusiness programs were inadequate or almost nonexistent.

It was also found that existing systems of recording and describing curriculum documents and their specific parts for use as curriculum guides. Therefore, it was necessary for the project staff to develop a more detailed review instrument in order to determine the utility of each document for the project.

The formative review process utilized by the project staff involving the three groups of reviewers (teachers, industry personnel, and curriculum specialists) was quite successful. There was general agreement between the three groups regarding the specific information to be included in the guides. This indicated that the teachers and curriculum specialists were well aware of the entry level competencies and processes in the eight agribusiness occupational areas. This type of formative review placed a relatively large work load on the group of thirteen curriculum specialists. This was a small number to share the responsibility of reviewing all drafts of the material in the curriculum guides in addition to their own professional job responsibilities. However, the detailed remarks by these reviewers indicated responsible attention to the review process.

Curriculum Guide Field Test Phase

In relation to the first component of the field test which involved a monitoring and description of the policies and procedures used by the various states in disseminating the national curriculum guides, a majority of the national conference participants appeared to have well developed plans for dissemination of the curriculum guides. The state leaders tended to indicate use of the national curriculum guides more for regional, state and local planning than for use by teachers in planning daily lessons. Many state leaders indicated that the career preparation guides would provide much direction for developing specialized agribusiness programs in their states. However, plans for dissemination and utilization of the career awareness and exploration curriculum guides appeared to be less specific. The reliance on in-service workshops for teachers for dissemination of curriculum materials was evidenced by the fact that this was the strategy most often indicated to be used to disseminate curriculum guides.

The national conference participants indicated a wide range of dissemination activities in which they had participated during the year following the conference. However, there was great variation among the states in relation to the number of activities completed and the amount of effort expended in disseminating the guides. In addition, the state leaders appeared to have put much more effort into disseminating the career preparation guides than in disseminating the career awareness and career exploration guides. This may suggest a lack of commitment to the career education in agribusiness effort by some states or their agricultural leadership, a lack of time and funds to promote use of the curriculum guides, competing materials which had previously been developed at the regional or state level, misunderstanding or the intent or purposes of the national curriculum guide effort, a lack of direct contact between the conference participants and those responsible for K-9 career education programs, or a combination of these factors. It should be pointed out that a majority of the national conference participants did reflect very favorable attitudes toward the national curriculum guides regardless of the dissemination efforts put forth.

The major purpose of the second component of the field test was to monitor and describe the teachers' reactions to the adequacy and usefulness of the national curriculum guides. Perhaps the conclusions based upon the findings of this part of the field test have the greatest implications concerning use of the national curriculum guides and for future development of curriculum materials in the agribusiness, natural resources, and environmental protection cluster.

As for the career awareness and career exploration curriculum guides, the teachers in general had successful experiences in planning and teaching selected units from them. The guides were used to the greatest extent and were perceived as having the greatest value for determining what to teach. However, the elementary teachers did utilize the suggested student activities and evaluation techniques sections of the units to some extent. This seems to indicate that the K-9 curriculum guides were also of much value in assisting the teachers in determining how to teach the unit. From the findings of the study, those teachers in the lower grades tended to utilize the guides more and value them higher. Conclusions from this finding are open to conjecture, however, this may indicate a greater interest in developing career awareness programs at the lower grade levels or that the units for the lower grade levels are of higher quality. From the teachers' reactions to the curriculum guides and the units they taught, it appears that the format utilized in breaking down the career development concepts into units was quite appropriate. In addition, the teachers were very favorable toward the types of suggested student activities and evaluation activities which were provided. Although the overall response to the career awareness and career exploration curriculum guides was not as favorable as was the reaction to the career preparation guides, the major dissatisfaction with the guides was in two areas. The first area of dissatisfaction was in the availability of appropriate instructional materials and equipment in the school districts. The second major area of dissatisfaction was that more in-depth instructional materials for teacher and student use would be prefered to curriculum guides to plan teaching strategies. Evidently, elementary level teachers are finding that appropriate supportive materials in the agribusiness cluster are not readily available in quantity or quality and that they are unable to develop the necessary materials themselves.

In relation to the career preparation curriculum guides, the teachers' reactions after teaching one of the units were generally very favorable. The teachers assigned to the group using the curriculum guides indicated the guides were of greatest use and value for planning what to teach rather than how to teach the unit. To emphasize this point, the teachers used the guides more for determining the objectives or behavioral outcomes desired from instruction and selecting content or subject matter than they did for selecting student activities, references, and evaluation techniques. The teachers' reactions to the specific units taught and the curriculum guides in general indicate that the guides were appropriate for program

planning activities. The teachers generally approved the format which was utilized in the units. In addition, the teachers indicated overwhelmingly that the material in the curriculum guides was technically correct as well as containing realistic and uncomplicated suggestions for student activities and evaluation. Perhaps the best indicator of the adequacy and usefulness of the career preparation curriculum guides is that most of the teachers indicated that they would recommend the guides to other teachers for use in planning their teaching. The major area of teacher dissatisfaction with the career preparation curriculum guides involved the suggested teacher and student references. However, as the guides were developed for use in all states, the suggested teacher and student reference lists could not be developed so as to apply to each local situation. This criticism, then, is not surprising and in fact should have been anticipated. As for the sections of the curriculum guides other than the units, the teachers indicated greater usefulness of the recommended facilities and equipment lists and teacher requirements and responsibilities sections than the lists of technical societies and associations and employment opportunities sections. These sections of the guides would undoubtedly be of greater value for individuals planning and developing new programs or updating present programs than for teachers planning lessons. Although most teachers had rewarding experiences with use of the career preparation guides, a majority indicated that the best use of the guides would be for planning programs rather than developing teaching plans. This reaction has many implications for future use of the career preparation guides. In summary, the results of the field test suggest a very favorable reaction by teachers toward the career preparation curriculum guides. However, use of the national curriculum guides needs to be put into proper perspective in that the guides may be of greater value for planning and updating programs than as a guide for teacher lesson planning.

The third component of the field test was a monitoring of student achievement in classes whose teachers did or did not utilize the national curriculum guides for planning their teaching strategy. A comparison group was selected from the career preparation classes, however, all career awareness and career exploration teachers used the curriculum guides. Therefore comparisons between classes on the basis of utilization of the national curriculum guides was possible for the career preparation units but not for the career awareness and career exploration units.

From the findings of this component of the field test of the career awareness and career exploration guides, one major conclusion is evident. In general, those teachers who engaged in a higher number of planning and teaching activities had

higher student achievement on the criterion-referenced tests. In addition, those teachers utilizing the curriculum guide to a greater extent had higher achievement in their classes. It could be concluded therefore, that teachers willing to use the curriculum guide for planning their teaching strategy along with efforts to provide students with many varied experiences related to the unit realized greater success as measured by student achievement.

In relation to the career preparation teachers, those who used the curriculum guides for planning their teaching strategy did not have a significantly higher number of planning and teaching activities than did those in the comparison group. However, this does not suggest that the quality of the planning and teaching activities of the two groups was not significantly different.

From the findings of the field test, use of the career preparation guides did not result in significantly higher achievement by students. However, those relationships between the various teacher and class activities and characteristics and student achievement point to at least one important conclusion. In general, those teachers who valued the curriculum guide higher had classes with higher achievement on the criterion-referenced tests. In order for curriculum guides to be of greatest benefit to students, teachers must perceive them as having value.

RECOMMENDATIONS

Curriculum Guide Development Phase

1. That national coordination be given to further development and maintenance of occupational descriptions and analysis of all entry level jobs in the eight agribusiness occupational areas and that close attention be given to not only current job availability but also to future employment trends in these occupational areas.

2. That national coordination be given to further development and maintenance of job skills or competency lists for each of the agribusiness occupations.

3. That national or regional efforts be applied to developing instructional materials for teachers and students in the instructional programs where specific teaching materials are very limited.

4. That the classification system developed for use in this project be proposed as a model for classifying agribusiness materials in national information systems. Curriculum material developers should have access to a more detailed classification of each type of information included in each document.

5. That educators make provision in pre-service and in-service programs to develop knowledge and skills regarding the use of various types of curriculum materials.

Curriculum Guide Field Test Phase

In relation to the career awareness and career exploration guides for grades K-9, three recommendations can be made.

1. Perhaps the major recommendation of the field test of the curriculum guides for grade K-9 is that there are not adequate instructional materials in quality or quantity for teachers developing career awareness and exploration programs. For career education at the lower grade levels in agribusiness, natural resources and environmental protection to achieve success, teachers and students must have appropriate supportive materials.

2. Although many elementary and junior high school teachers had very successful experiences using the curriculum guides, a majority of the teachers indicated a preference for more complete instructional materials. Rather than indicating a need for major revision of the curriculum guides, this implies that future curriculum development in the agribusiness, natural resources and environmental protection cluster for grades K-9 should be in the form of in-depth instructional materials for teachers and students rather than additional curriculum guides for teacher lesson planning.

3. Many of the career awareness teachers indicated that they experienced problems in utilizing the curriculum guide to plan their teaching strategy. This may indicate that elementary teachers require some form of in-service training in the proper use of the curriculum guide in order to experience success in using them to plan for teaching.

In relation to the career preparation curriculum guides for grades 10 - 12 the following recommendations are presented:

1. The field test indicates that no major revisions are warranted. The teachers generally approved of the format that was used in the curriculum guides and agreed that the content material was technically correct. The only area of dissatisfaction with the career preparation guides was in the teacher and student resources suggested which could have been predicted due to the variation between programs.

2. The national curriculum guide effort was seen by some state leaders in agricultural education as competition for curriculum development that had previously been accomplished or was in process in their states. It is apparent that curriculum guide development must be put into proper perspective in order to best serve the teachers. Development of a national curriculum guide for use by teachers in planning for classroom teaching may not be the most desirable approach to curriculum development in agribusiness, natural resources and environmental protection. It seems much more desirable to develop regional, state, and/or local curriculum materials within the general framework of a national curriculum guide. Development of a framework or parameters for more in-depth development of localized materials was one of the original purposes of the national curriculum guide effort. Perhaps more emphasis should be placed on use of the national curriculum guides in this manner rather than promotion of their use as curriculum guides for teacher lesson planning.

3. It should be quite evident that a curriculum guide, regardless of its quality, cannot be considered as a replacement for good planning and teaching. From the findings of the field test, it would appear that use of a curriculum guide will not automatically result in higher student achievement. However, a curriculum guide can improve the efficiency of the teacher as well as provide the framework in which a vocational program should operate. This may imply that some emphasis should be given in pre-service and in-service teacher education programs on the proper utilization of curriculum guides and other curriculum materials.

4. In order for curriculum guides to be of greatest help to teachers, they must perceive them as having value. This may be best accomplished through more active involvement of teachers in the developmental process.

5. Many of the teachers indicated that their programs were lacking facilities and equipment and teacher and student reference materials for specialized programs in the agribusiness, natural resources, and environmental protection

cluster. Perhaps this indicates a need for renewed efforts by leaders in agricultural education in the various states to develop quality programs with adequate support. In addition, curriculum material laboratories need to make special efforts to develop the types of curriculum materials needed to support specialized programs.

6. The strategy used for field testing national curriculum Gudies has some implications for individuals involved in curriculum material development and its evaluation. Although this field test did not show significant differences in class achievement between teachers using and not using the guide, one might expect that more in-depth curriculum materials would often produce significant differences. Developers of curriculum materials must seriously consider the question of whether or not their materials represent true curricular improvements. Perhaps use of in-school evaluation strategies such as this can significantly improve the quality of curriculum materials available as well as provide opportunities for teachers of vocational agriculture and their students to become viable sources of evaluative feedback.

Based on the information included in this report, the following general recommendations concerning use of the curriculum guides are presented:

1. The career awareness and exploration curriculum guides should be used as guidelines in developing more in-depth career education instructional materials in the agribusiness cluster for grades K-9.

2. Some emphasis should be placed on development of supportive materials for career awareness and exploration programs in agribusiness by developers of instructional materials.

3. More emphasis should be placed on use of the career awareness and exploration guides for planning K-9 career education programs.

4. The career preparation guides should be utilized as guidelines in developing more in-depth regional, state, and local curriculum materials for teacher lesson planning.

5. Greater emphasis should be placed on use of the career preparation guides for planning specialized agribusiness programs by state leaders in agricultural education, school administrators, and teachers.

6. More emphasis should be given to better utilization of curriculum materials in pre-service and in-service teacher education programs for grades K-12.

7. Major revision of the national curriculum guides is not warranted.

Dissemination of the Curriculum Guides

The curriculum guides developed by this project will be made available nationwide by the Ohio Agricultural Education Curriculum Materials Service. The curriculum guides will be sold at cost. The address at which the curriculum guides are available is:

Ohio Agricultural Education
Curriculum Materials Service
Room 254, 2120 Fyffe Road
Columbus, Ohio 43210

The titles of the ten career education in agribusiness, natural resources, and environmental protection curriculum guides are as follows:

Career Awareness in Agribusiness, Renewable Natural Resources and Environmental Protection: A Curriculum Guide for Grades K-6
Career Exploration in Agribusiness, Renewable Natural Resources and Environmental Protection: A Curriculum Guide for Grades 7-9
Career Preparation in Agricultural Production
Career Preparation in Agricultural Supplies and Services
Career Preparation in Agricultural Equipment and Mechanics
Career Preparation in Agricultural Products (Food Processing)
Career Preparation in Ornamental Horticulture
Career Preparation in Agricultural Resources
Career Preparation in Forestry
Career Preparation in Environmental Protection

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